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Case Report

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An Unusual Case of Chronic Cough

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Introduction

Chronic cough is a common symptom. Often the diagnosis is benign and treatable if the chest radiograph is normal. After evaluation for common differential diagnosis, a high index of suspicion to exclude serious causes is crucial in a persistent cough. Foreign body aspiration can cause chronic cough and if left undiagnosed, it can be potentially life-threatening. A delay to diagnosis may occur especially if the patient is unaware or has no recollection of choking on a foreign body, as symptoms and signs are often non-specific.

Case Presentation

A 69-year-old Malay male presented with cough for more than 8 weeks, productive of whitish sputum. He was a never smoker, and his past medical history included hypertension and hyperlipidemia. The cough was worse at night and in the supine position. He did not have any hemoptysis, wheezing or breathlessness. His drug history included only a calcium channel blocker for his hypertension, and he did not have any symptoms to suggest reflux disease or Upper Airway Cough Syndrome (UACS). His symptoms did not improve despite having completed two courses of antibiotics. On examination his blood pressure was 152/90 mmHg with a heart rate of 87 beats per minute, pulse oximetry was 97% on ambient air. Examination of the upper airways was unremarkable. On auscultation, lung sounds were vesicular and equal bilaterally. The chest radiograph Figure 1 showed no sinister lesion or consolidation. The patient could not perform spirometry due to intractable coughing. The Methacholine Challenge Test (MCT) Figure 2 was negative for bronchial hyper-responsiveness, and the fractional exhaled nitric oxide (FeNO) was low at 11 parts per billion.

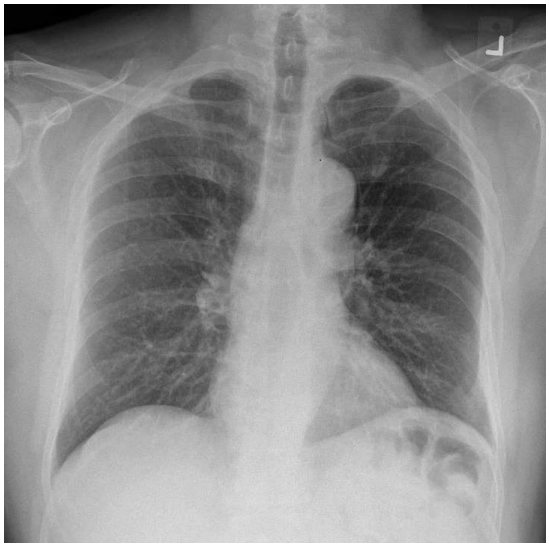
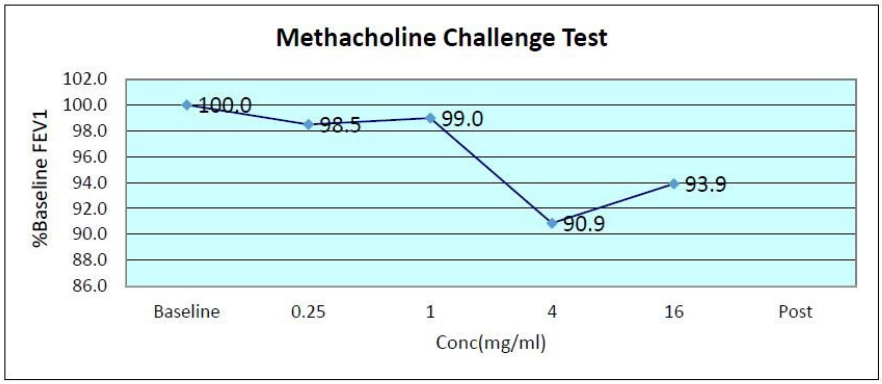


Figure 1: Chest radiograph shows no sinister lesion or consolidation.

Conc(mg/ml)	Baseline	0.25	1	4	16	Post
FEV1	1.97	1.94	1.95	1.79	1.85	
%Baseline	100.0	98.5	99.0	90.9	93.9	
QC Grade	A	A	A	A	A	



Bronchial Responsiveness PC 20 = >16 mg/ml

Figure 2: Methacholine Challenge Test showing no Bronchial Hyper-Responsiveness.

As his chest radiograph and MCT were normal, he was empirically treated for UACS and reflux disease with oral montelukast 10 mg and oral omeprazole 40 mg daily. However, his cough did not improve on subsequent follow up 6 weeks later. He was particularly disturbed by the copious amount of sputum production. A Computed Tomography (CT) scan of the thorax was done (with the objective of excluding bronchiectasis) and it showed a V-shaped radio-opaque foreign body in the right main bronchus, which was suspicious for an aspirated foreign body (Figure 3a and 3b). The longest diameter of the foreign body was 2.2 cm. No pneumomediastinum or suspicious endobronchial lesion was seen.

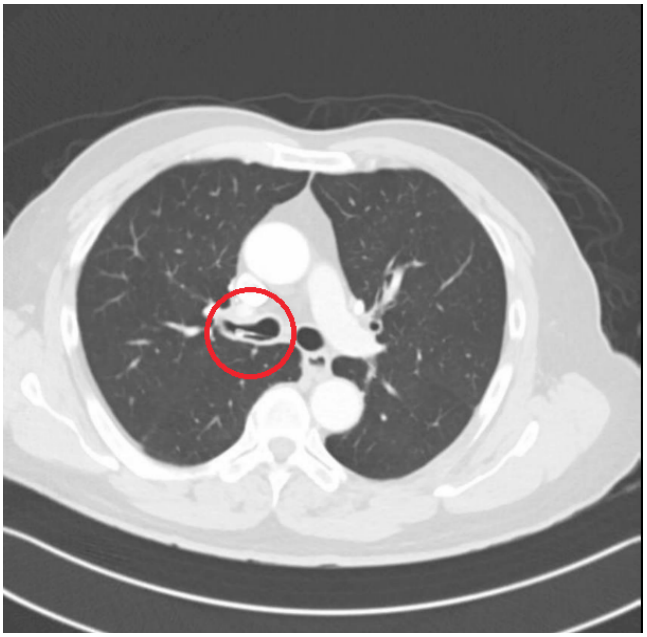


Figure 3a and 3b: CT Thorax showing the V-shaped foreign body in the right main bronchus

After the scan, the patient was asked if he recalled any choking episode while eating before the cough onset. He revealed that he might have swallowed a bone during dinner, but he had thought it would have gone into his gut. Rigid bronchoscopy was performed to remove the foreign body. Intraoperatively, a foreign body traversing the lumen of the right main bronchus was seen. Rigid forceps were used, and as the foreign body broke into 3 parts as it was soft at its two ends. The foreign body was removed completely and found to be found to be a chicken bone, likely a wishbone (Figure 4).

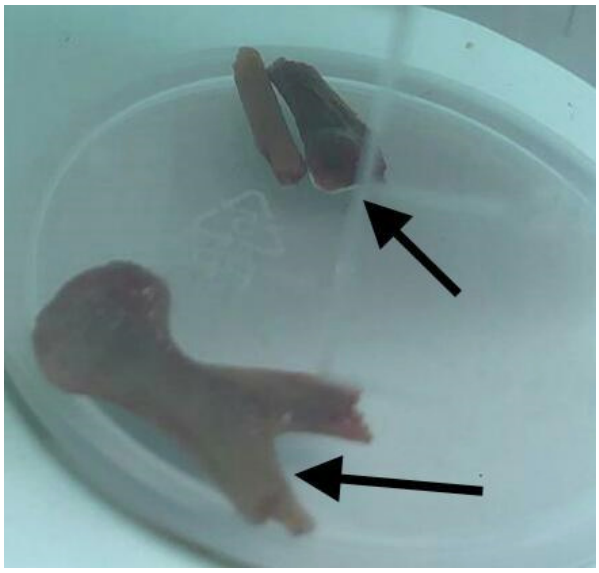


Figure 4: The chicken bone removed by rigid bronchoscopy.

One month later, he was seen in the clinic and completely asymptomatic. Chest radiograph Figure 5 showed no residual radio-opaque foreign body, consolidation, collapse, pneumothorax or pneumomediastinum.

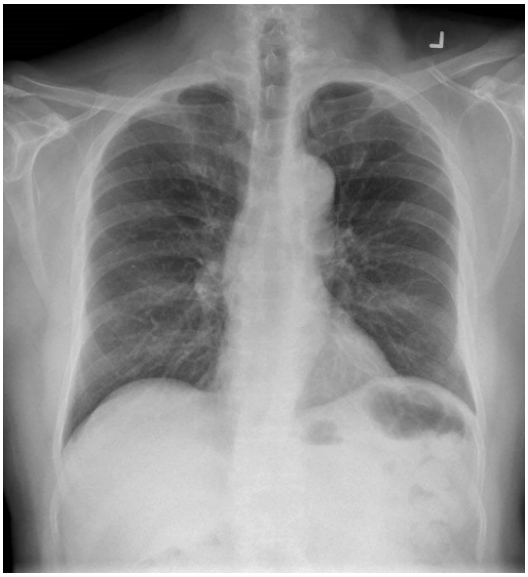


Figure 5: The follow-up chest radiograph showed no residual radio-opaque foreign body, consolidation, collapse, pneumothorax or pneumomediastinum.

Discussion

Cough is a common presenting symptom. Cough is a defence mechanism which helps to clear excessive secretion and

foreign material from the airway [1]. Cough can be classified based on its duration; as acute (symptoms <3 weeks), subacute (3-8 weeks) and chronic (> 8 weeks) [2]. Most common causes for cough are UACS, asthma, Gastroesophageal Reflux Disease (GERD), non-asthmatic eosinophil bronchitis, or a combination of these conditions [3]. We should evaluate and treat for the common causes of cough, and if cough persists despite empirical treatment, one must consider the less common aetiologies of cough. These include bronchiectasis, non-resolving pneumonia, endobronchial tuberculosis, sarcoidosis, lymphoma and Foreign Body Aspiration (FBA) [4].

FBA is a potentially life-threatening emergency, requiring immediate intervention. It is seen more commonly in the pediatric population, accounting for 75% of the total cases [5-7]. FBA in adults and elderly accounts for 25% of the cases [6,7]. The most frequent risk factors are older age, psychiatric illness [8], abuse of sedative medications, neurological disorders, mental retardation, trauma with loss of consciousness, dental care, alcoholism, tracheostomy cannula handling [9-11], and male sex [12-14]. The clinical symptoms may often be very subtle and may remain undetected for years. The classic "penetrating syndrome", described as choking episode followed by an intractable cough, is not commonly seen in adults. Cough is the most common symptom seen in 58-96% of the patients [15-19]. Other symptoms may include hemoptysis, fever, wheezing, dyspnoea [18]. Patient recollection of FBA is variable and only one- third of the patient above the age of 65 years can give a consistent history of aspiration [20]. This often leads to a delay in diagnosis. Patients are misdiagnosed as asthma, bronchitis, pneumonia or bronchiectasis. Physical examination may be normal however some patients may have hoarseness of voice, wheezing, stridor or absent breath sounds [21].

If FBA is suspected chest radiograph is the first-line imaging study. In some instances, it should be noted that the foreign body may not be detectable due to its small size and radiolucent property. Indirect signs of foreign body include atelectasis, air-trapping, and consolidation [9,22-25]. On fluoroscopy, if the airway is occluded, the lung volume of the affected side does not change during the respiratory cycle. CT thorax offers greater diagnostic sensitivity for FBA with the added benefit of pre-bronchoscopy planning [10]. Detection for complications of foreign body aspiration is also more superior on CT thorax.

FBA in adults is more frequently seen in the right bronchial tree due to the vertical course of the right main stem bronchus (71.5% vs 22.8%) [26]. The first successful case of foreign body extraction was done by Gustav Killian in 1897. He removed a splinter from the right main bronchus using a modified Mikulicz-Rosenheim esophagoscopy (a rigid tube illuminated with a mirror) and rigid -forceps [27]. Most of the foreign bodies in an Asian Chinese study were bone fragments (chicken bone, fish bone), which accounted for 49% of all cases [11]. This is different from the western population and likely reflects cultural differences in food preparation, preference, and utensils in the Asian compared with Western population [11].

Rigid bronchoscopy has been the gold standard for the removal of tracheobronchial foreign body, especially in children. With the latest improvements in technology and techniques, flexible fibre optic bronchoscopy has supplanted rigid bronchoscopy as the tool for FB removal in adults. Rigid Bronchoscopy has the advantage of a large working channel, which permits the use of other tools for extraction even a flexible bronchoscope [28]. It provides a stable portal of entry into the bronchial tree and protects the central airways from sharp objects. The drawbacks are that it is only available in selected centers with interventional pulmonology expertise, the procedure requires general anesthesia and inability to perform the procedure in cases with cervicofacial trauma. Flexible bronchoscopy, on the other hand, is widely available, can also be used through an endotracheal tube, can be performed regardless of cervicofacial trauma and no general anesthesia is needed. But it does not provide a secure airway with risks of airway trauma from the sharp objects [21]. Complications are minimal with either rigid or flexible bronchoscopy. The choice of the technique also depends on the training, expertise, and preference of the bronchoscopist.

Conclusion

FBA into the tracheobronchial tree is uncommon in adults as compared to children. The initial symptoms, physical examination, and radiological investigation may be normal or nonspecific. A high index of suspicion is required for diagnosis. Once identified, the foreign body should be removed as early as possible by either flexible fibre optic or rigid bronchoscopy.

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